

# SEQUENCE LISTING

<110> Zhou, Ming-Ming  
Goldfarb, Mitchell

<120> Methods of Identifying Modulators of the  
FGF Receptor

<130> 2459-1-002N

<140> 09/757,415

<141> 2001-01-09

<150> 60/175,867

<151> 2000-01-12

<160> 33

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 508

<212> PRT

<213> Homo sapiens

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His	Arg	Asn	Lys	Phe	Lys	Val	Ile	Asn	Val	Asp	Asp	Asp	Gly	Asn	Glu	20	25	30	
Leu	Gly	Ser	Gly	Ile	Met	Glu	Leu	Thr	Asp	Thr	Glu	Leu	Ile	Leu	Tyr	35	40	45	
Thr	Arg	Lys	Arg	Asp	Ser	Val	Lys	Trp	His	Tyr	Leu	Cys	Leu	Arg	Arg	50	55	60	
Tyr	Gly	Tyr	Asp	Ser	Asn	Leu	Phe	Ser	Phe	Glu	Ser	Gly	Arg	Arg	Cys	65	70	75	80
Gln	Thr	Gly	Gln	Gly	Ile	Phe	Ala	Phe	Lys	Cys	Ala	Arg	Ala	Glu	Glu	85	90	95	
Leu	Phe	Asn	Met	Leu	Gln	Glu	Ile	Met	Gln	Asn	Asn	Ser	Ile	Asn	Val	100	105	110	
Val	Glu	Glu	Pro	Val	Val	Glu	Arg	Asn	Asn	His	Gln	Thr	Glu	Leu	Glu	115	120	125	
Val	Pro	Arg	Thr	Pro	Arg	Thr	Pro	Thr	Thr	Pro	Gly	Phe	Ala	Ala	Gln	130	135	140	
Asn	Leu	Pro	Asn	Gly	Tyr	Pro	Arg	Tyr	Pro	Ser	Phe	Gly	Asp	Ala	Ser	145	150	155	160
Ser	His	Pro	Ser	Ser	Arg	His	Pro	Ser	Val	Gly	Ser	Ala	Arg	Leu	Pro	165	170	175	
Ser	Val	Gly	Glu	Glu	Ser	Thr	His	Pro	Leu	Leu	Val	Ala	Glu	Glu	Gln	180	185	190	
Val	His	Thr	Tyr	Val	Asn	Thr	Thr	Gly	Val	Gln	Glu	Glu	Arg	Lys	Asn	195	200	205	
Arg	Thr	Ser	Val	His	Val	Pro	Leu	Glu	Ala	Arg	Val	Ser	Asn	Ala	Glu	210	215	220	
Ser	Ser	Thr	Pro	Lys	Glu	Glu	Pro	Ser	Ser	Ile	Glu	Asp	Arg	Asp	Pro	225	230	235	240

Gln	Ile	Leu	Leu	Glu	Pro	Glu	Gly	Val	Lys	Phe	Val	Leu	Gly	Pro	Thr	
				245					250					255		
Pro	Val	Gln	Lys	Gln	Leu	Met	Glu	Lys	Glu	Lys	Leu	Glu	Gln	Leu	Gly	
			260					265					270			
Arg	Asp	Gln	Val	Ser	Gly	Ser	Gly	Ala	Asn	Asn	Thr	Glu	Trp	Asp	Thr	
		275					280					285				
Gly	Tyr	Asp	Ser	Asp	Glu	Arg	Arg	Asp	Ala	Pro	Ser	Val	Asn	Lys	Leu	
	290					295					300					
Val	Tyr	Glu	Asn	Ile	Asn	Gly	Leu	Ser	Ile	Pro	Ser	Ala	Ser	Gly	Val	
305					310					315					320	
Arg	Arg	Gly	Arg	Leu	Thr	Ser	Thr	Ser	Thr	Ser	Asp	Thr	Gln	Asn	Ile	
				325					330					335		
Asn	Asn	Ser	Ala	Gln	Arg	Arg	Thr	Ala	Leu	Leu	Asn	Tyr	Glu	Asn	Leu	
			340					345					350			
Pro	Ser	Leu	Pro	Pro	Val	Trp	Glu	Ala	Arg	Lys	Leu	Ser	Arg	Asp	Glu	
		355					360					365				
Asp	Asp	Asn	Leu	Gly	Pro	Lys	Thr	Pro	Ser	Leu	Asn	Gly	Tyr	His	Asn	
	370					375					380					
Asn	Leu	Asp	Pro	Met	His	Asn	Tyr	Val	Asn	Thr	Glu	Asn	Val	Thr	Val	
385					390					395					400	
Pro	Ala	Ser	Ala	His	Lys	Ile	Glu	Tyr	Ser	Arg	Arg	Arg	Asp	Cys	Thr	
				405					410					415		
Pro	Thr	Val	Phe	Asn	Phe	Asp	Ile	Arg	Arg	Pro	Ser	Leu	Glu	His	Arg	
			420					425					430			
Gln	Leu	Asn	Tyr	Ile	Gln	Val	Asp	Leu	Glu	Gly	Gly	Ser	Asp	Ser	Asp	
		435					440					445				
Asn	Pro	Gln	Thr	Pro	Lys	Thr	Pro	Thr	Thr	Pro	Leu	Pro	Gln	Thr	Pro	
	450					455					460					
Thr	Arg	Arg	Thr	Glu	Leu	Tyr	Ala	Val	Ile	Asp	Ile	Glu	Arg	Thr	Ala	
465					470					475					480	
Ala	Met	Ser	Asn	Leu	Gln	Lys	Ala	Leu	Pro	Arg	Asp	Asp	Gly	Thr	Ser	
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Arg	Lys	Thr	Arg	His	Asn	Ser	Thr	Asp	Leu	Pro	Met					
			500					505								

<210> 2

<211> 822

<212> PRT

<213> Mus musculus

<400> 2

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Thr	Leu	Cys	Thr	Ala	Arg	Pro	Ala	Pro	Thr	Leu	Pro	Glu	Gln	Ala	Gln	
			20					25					30			
Pro	Trp	Gly	Val	Pro	Val	Glu	Val	Glu	Ser	Leu	Leu	Val	His	Pro	Gly	
	35					40						45				
Asp	Leu	Leu	Gln	Leu	Arg	Cys	Arg	Leu	Arg	Asp	Asp	Val	Gln	Ser	Ile	
	50					55				60						
Asn	Trp	Leu	Arg	Asp	Gly	Val	Gln	Leu	Val	Glu	Ser	Asn	Arg	Thr	Arg	
65					70					75					80	
Ile	Thr	Gly	Glu	Glu	Val	Glu	Val	Arg	Asp	Ser	Ile	Pro	Ala	Asp	Ser	
				85					90					95		
Gly	Leu	Tyr	Ala	Cys	Val	Thr	Ser	Ser	Pro	Ser	Gly	Ser	Asp	Thr	Thr	
			100					105					110			
Tyr	Phe	Ser	Val	Asn	Val	Ser	Asp	Ala	Leu	Pro	Ser	Ser	Glu	Asp	Asp	

		115					120					125				
Asp	Asp	Asp	Asp	Asp	Ser	Ser	Ser	Glu	Glu	Lys	Glu	Thr	Asp	Asn	Thr	
	130					135					140					
Lys	Pro	Asn	Arg	Arg	Pro	Val	Ala	Pro	Tyr	Trp	Thr	Ser	Pro	Glu	Lys	
145					150					155					160	
Met	Glu	Lys	Lys	Leu	His	Ala	Val	Pro	Ala	Ala	Lys	Thr	Val	Lys	Phe	
				165					170					175		
Lys	Cys	Pro	Ser	Ser	Gly	Thr	Pro	Asn	Pro	Thr	Leu	Arg	Trp	Leu	Lys	
			180					185				190				
Asn	Gly	Lys	Glu	Phe	Lys	Pro	Asp	His	Arg	Ile	Gly	Gly	Tyr	Lys	Val	
	195					200					205					
Arg	Tyr	Ala	Thr	Trp	Ser	Ile	Ile	Met	Asp	Ser	Val	Val	Pro	Ser	Asp	
	210					215					220					
Lys	Gly	Asn	Tyr	Thr	Cys	Ile	Val	Glu	Asn	Glu	Tyr	Gly	Ser	Ile	Asn	
225					230					235					240	
His	Thr	Tyr	Gln	Leu	Asp	Val	Val	Glu	Arg	Ser	Pro	His	Arg	Pro	Ile	
				245					250					255		
Leu	Gln	Ala	Gly	Leu	Pro	Ala	Asn	Glu	Thr	Val	Ala	Leu	Gly	Ser	Asn	
			260					265				270				
Val	Glu	Phe	Met	Cys	Lys	Val	Tyr	Ser	Asp	Pro	Gln	Pro	His	Ile	Gln	
		275				280					285					
Trp	Leu	Lys	His	Ile	Glu	Val	Asn	Gly	Ser	Lys	Ile	Gly	Pro	Asp	Asn	
	290					295					300					
Leu	Pro	Tyr	Val	Gln	Ile	Leu	Lys	Thr	Ala	Gly	Val	Asn	Thr	Thr	Asp	
305					310					315					320	
Lys	Glu	Met	Glu	Val	Leu	His	Leu	Arg	Asn	Val	Ser	Phe	Glu	Asp	Ala	
				325					330					335		
Gly	Glu	Tyr	Thr	Cys	Leu	Ala	Gly	Asn	Ser	Ile	Gly	Leu	Ser	His	His	
			340					345				350				
Ser	Ala	Trp	Leu	Thr	Val	Leu	Glu	Ala	Leu	Glu	Glu	Arg	Pro	Ala	Val	
		355					360					365				
Met	Thr	Ser	Pro	Leu	Tyr	Leu	Glu	Ile	Ile	Ile	Tyr	Cys	Thr	Gly	Ala	
	370					375					380					
Phe	Leu	Ile	Ser	Cys	Met	Leu	Gly	Ser	Val	Ile	Ile	Tyr	Lys	Met	Lys	
385					390					395					400	
Ser	Gly	Thr	Lys	Lys	Ser	Asp	Phe	His	Ser	Gln	Met	Ala	Val	His	Lys	
				405					410					415		
Leu	Ala	Lys	Ser	Ile	Pro	Leu	Arg	Arg	Gln	Val	Thr	Val	Ser	Ala	Asp	
			420					425				430				
Ser	Ser	Ala	Ser	Met	Asn	Ser	Gly	Val	Leu	Leu	Val	Arg	Pro	Ser	Arg	
		435					440					445				
Leu	Ser	Ser	Ser	Gly	Thr	Pro	Met	Pro	Ala	Gly	Val	Ser	Glu	Tyr	Glu	
	450					455					460					
Leu	Pro	Glu	Asp	Pro	Arg	Trp	Glu	Leu	Pro	Arg	Asp	Arg	Leu	Val	Leu	
465					470					475		</				

Arg	Pro	Pro	Gly	Leu	Glu	Tyr	Cys	Tyr	Asn	Pro	Ser	His	Asn	Pro	Glu
			580					585					590		
Glu	Gln	Leu	Ser	Ser	Lys	Asp	Leu	Val	Ser	Cys	Ala	Tyr	Gln	Val	Ala
		595					600					605			
Arg	Gly	Met	Glu	Tyr	Leu	Ala	Ser	Lys	Lys	Cys	Ile	His	Arg	Asp	Leu
	610					615					620				
Ala	Ala	Arg	Asn	Val	Leu	Val	Thr	Glu	Asp	Asn	Val	Met	Lys	Ile	Ala
625					630					635					640
Asp	Phe	Gly	Leu	Ala	Arg	Asp	Ile	His	His	Ile	Asp	Tyr	Tyr	Lys	Lys
			645					650						655	
Thr	Thr	Asn	Gly	Arg	Leu	Pro	Val	Lys	Trp	Met	Ala	Pro	Glu	Ala	Leu
		660						665					670		
Phe	Asp	Arg	Ile	Tyr	Thr	His	Gln	Ser	Asp	Val	Trp	Ser	Phe	Gly	Val
	675						680					685			
Leu	Leu	Trp	Glu	Ile	Phe	Thr	Leu	Gly	Gly	Ser	Pro	Tyr	Pro	Gly	Val
	690					695					700				
Pro	Val	Glu	Glu	Leu	Phe	Lys	Leu	Leu	Lys	Glu	Gly	His	Arg	Met	Asp
705				710						715					720
Lys	Pro	Ser	Asn	Cys	Thr	Asn	Glu	Leu	Tyr	Met	Met	Met	Arg	Asp	Cys
			725						730					735	
Trp	His	Ala	Val	Pro	Ser	Gln	Arg	Pro	Thr	Phe	Lys	Gln	Leu	Val	Glu
		740						745					750		
Asp	Leu	Asp	Arg	Ile	Val	Ala	Leu	Thr	Ser	Ser	Gln	Glu	Tyr	Leu	Asp
	755					760					765				
Leu	Ser	Ile	Pro	Leu	Asp	Gln	Tyr	Ser	Pro	Ser	Phe	Pro	Asp	Thr	Arg
	770					775					780				
Ser	Ser	Thr	Cys	Ser	Ser	Gly	Glu	Asp	Ser	Val	Phe	Ser	His	Glu	Pro
785				790						795					800
Leu	Pro	Glu	Glu	Pro	Cys	Leu	Pro	Arg	His	Pro	Thr	Gln	Leu	Ala	Asn
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Ser	Gly	Leu	Lys	Arg	Arg										
			820												

<210> 3  
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 <212> PRT  
 <213> Mus musculus

<400> 3  
 His Ser Gln Met Ala Val His Lys Leu Ala Lys Ser Ile Pro Leu Arg  
 1 5 10 15  
 Arg Gln Val Thr Val Ser  
 20

<210> 4  
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 <213> Artificial Sequence

<220>  
 <223> Tyrosine phosphorylation peptide

<221> VARIANT  
 <222> (9)...(9)  
 <223> Xaa is a phosphotyrosine

<400> 4  
Leu Val Ile Ala Gly Asn Pro Ala Xaa Arg Ser  
1 5 10

<210> 5  
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<213> Artificial Sequence

<220>  
<223> Consensus sequence

<221> VARIANT  
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<223> Xaa = Any Amino Acid

<221> VARIANT  
<222> (5)...(7)  
<223> Xaa = Any Amino Acid

<221> VARIANT  
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<221> VARIANT  
<222> (11)...(11)  
<223> Xaa = Any Amino Acid

<221> VARIANT  
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<223> Xaa = Any Amino Acid

<221> VARIANT  
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<223> Xaa = Any Amino Acid

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Val Xaa Xaa Leu Xaa Xaa Xaa Ile Xaa Leu Xaa Arg Xaa Val Xaa Val  
1 5 10 15

<210> 6  
<211> 4  
<212> PRT  
<213> Artificial Sequence

<220>  
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<221> VARIANT  
<222> (3)...(3)  
<223> Xaa = Any Amino Acid

<221> VARIANT  
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<223> Xaa is a phosphotyrosine

<400> 6

Asn Pro Xaa Xaa

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<210> 7

<211> 12

<212> PRT

<213> Artificial Sequence

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<223> Synthetic peptide derived from the TrKA receptor

<221> VARIANT

<222> (8)...(8)

<223> Xaa is a phosphotyrosine

<400> 7

His Ile Ile Glu Asn Pro Gln Xaa Phe Ser Asp Ala

1

5

10

<210> 8

<211> 55

<212> PRT

<213> Homo sapiens

<400> 8

Asp Asn His Arg Asn Lys Phe Lys Val Ile Asn Val Asp Asp Asp Gly

1

5

10

15

Asn Glu Leu Gly Ser Gly Ile Met Glu Leu Thr Asp Thr Glu Leu Ile

20

25

30

Leu Tyr Thr Arg Lys Arg Asp Ser Val Lys Trp His Tyr Leu Cys Leu

35

40

45

Arg Arg Tyr Gly Tyr Asp Ser

50

55

<210> 9

<211> 55

<212> PRT

<213> Homo sapiens

<400> 9

Asp Asn His Pro Thr Lys Phe Lys Val Thr Asn Val Asp Asp Glu Gly

1

5

10

15

Val Glu Leu Gly Ser Gly Val Met Glu Leu Thr Gln Ser Glu Leu Val

20

25

30

Leu His Leu His Arg Arg Glu Ala Val Arg Trp Pro Tyr Leu Cys Leu

35

40

45

Arg Arg Tyr Gly Tyr Asp Ser

50

55

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<213> Homo sapiens

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Pro Ala Phe Lys Glu Val Trp Gln Val Ile Leu Lys Pro Lys Gly Leu  
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Gly Gln Thr Lys Asn Leu Ile Gly Ile Tyr Arg Leu Cys Leu Thr Ser  
20 25 30  
Lys Thr Ile Ser Phe Val Lys Leu Asn Ser Glu Ala Ala Val Val  
35 40 45  
Leu Gln Leu Met Asn Ile Arg Arg Cys Gly His Ser Glu  
50 55 60

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<213> Homo sapiens

<400> 11  
Ala Ala Tyr Arg Glu Val Trp Gln Val Asn Leu Lys Pro Lys Gly Leu  
1 5 10 15  
Gly Gln Ser Lys Asn Leu Thr Gly Val Tyr Arg Leu Cys Leu Ser Ala  
20 25 30  
Arg Thr Ile Gly Phe Val Lys Leu Asn Cys Glu Gln Pro Ser Val Thr  
35 40 45  
Leu Gln Leu Met Asn Ile Arg Arg Cys Gly His Ser Asp  
50 55 60

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<213> Mus musculus

<400> 12  
Ala Val Tyr Arg Glu Val Trp Gln Val Asn Leu Lys Pro Lys Gly Leu  
1 5 10 15  
Gly Gln Ser Lys Asn Leu Thr Gly Val Tyr Arg Leu Cys Leu Ser Ala  
20 25 30  
Arg Thr Ile Gly Phe Val Lys Leu Asn Cys Glu Gly Pro Ser Val Thr  
35 40 45  
Leu Gln Leu Asn Asn Ile Arg Arg Cys Gly His Ser Asp  
50 55 60

<210> 13  
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<213> Homo sapiens

<400> 13  
Pro Phe Tyr Lys Asp Val Trp Gln Val Ile Val Lys Pro Arg Gly Leu  
1 5 10 15  
Gly His Arg Lys Glu Leu Ser Gly Val Phe Arg Leu Cys Leu Thr Asp  
20 25 30





<210> 17  
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 <213> Homo sapiens

<400> 17  
 Asn Leu Phe Ser Phe Glu Ser Gly Arg Arg Cys Gln Thr Gly Gln Gly  
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 Ile Phe Ala Phe Lys Cys Ser Arg Ala Glu Glu Ile Phe Asn Leu Leu  
 20 25 30  
 Gln Asp Leu Met Gln Cys Asn Ser Ile Asn Val Met Glu Glu Pro Val  
 35 40 45  
 Ile Ile Thr Arg Asn Ser His Pro Ala Glu Leu Asp Leu Pro Arg Ala  
 50 55 60  
 Pro Gln Pro Pro Asn Ala Leu Gly  
 65 70

<210> 18  
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 <212> PRT  
 <213> Homo sapiens

<400> 18  
 Asn Phe Phe Phe Ile Glu Val Gly Arg Ser Ala Val Thr Gly Pro Gly  
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 Glu Phe Trp Met Gln Val Asp Asp Ser Val Val Ala Gln Asn Met His  
 20 25 30  
 Glu Thr Ile Leu Glu Ala Met Arg Ala Met Ser Asp Glu Phe Arg Pro  
 35 40 45  
 Arg

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 <212> PRT  
 <213> Homo sapiens

<400> 19  
 Ser Phe Phe Phe Ile Glu Val Gly Arg Ser Ala Val Thr Gly Pro Gly  
 1 5 10 15  
 Glu Leu Trp Met Gln Ala Asp Asp Ser Val Val Ala Gln Asn Ile His  
 20 25 30  
 Glu Thr Ile Leu Glu Ala Met Lys Ala Leu Lys Glu Leu Phe Glu Phe  
 35 40 45  
 Arg

<210> 20  
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 <212> PRT  
 <213> Mus musculus

<400> 20

Ser	Phe	Phe	Phe	Ile	Glu	Val	Gly	Arg	Ser	Ala	Val	Thr	Gly	Pro	Gly
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Glu	Leu	Trp	Met	Gln	Val	Asp	Asp	Ser	Val	Val	Ala	Gln	Asn	Ile	His
			20					25					30		
Glu	Thr	Ile	Leu	Glu	Ala	Met	Lys	Ala	Leu	Lys	Glu	Leu	Phe	Glu	Phe
		35					40					45			

Arg

<210> 21  
 <211> 49  
 <212> PRT  
 <213> Homo sapiens

Gln	Tyr	Phe	Phe	Leu	Glu	Val	Gly	Arg	Ser	Thr	Val	Ile	Gly	Pro	Gly
1				5					10					15	
Glu	Leu	Trp	Met	Gln	Val	Asp	Asp	Cys	Val	Val	Ala	Gln	Asn	Met	His
			20					25					30		
Glu	Leu	Phe	Leu	Glu	Lys	Met	Arg	Ala	Leu	Cys	Ala	Asp	Glu	Tyr	Arg
		35					40					45			

Ala

<210> 22  
 <211> 49  
 <212> PRT  
 <213> Mus musculus

Gln	Tyr	Phe	Phe	Leu	Glu	Val	Gly	Arg	Ser	Thr	Val	Ile	Gly	Pro	Gly
1				5					10					15	
Glu	Leu	Trp	Met	Gln	Val	Asp	Asp	Ser	Val	Val	Ala	Gln	Asn	Met	His
			20					25					30		
Glu	Leu	Phe	Leu	Glu	Lys	Met	Arg	Ala	Leu	Cys	Ala	Asp	Glu	Tyr	Arg
		35					40					45			

Ala

<210> 23  
 <211> 49  
 <212> PRT  
 <213> Mus musculus

Ser	Phe	Phe	Phe	Leu	Glu	Leu	Gly	Arg	Ser	Ala	Pro	Ile	Gly	Pro	Gly
1				5					10					15	
Glu	Leu	Trp	Leu	Gln	Ala	Pro	Asp	Ala	Val	Val	Ala	Gln	Ser	Ile	His
			20					25					30		
Glu	Thr	Val	Leu	Ala	Ala	Met	Lys	Arg	Leu	Gly	Ser	Asn	Ala	Ala	Gly
		35					40					45			

Lys

<210> 24  
<211> 22  
<212> PRT  
<213> Homo sapiens

<400> 24  
His Ser Gln Met Ala Val His Lys Leu Ala Lys Ser Ile Pro Leu Arg  
1 5 10 15  
Arg Gln Val Thr Val Ser  
20

<210> 25  
<211> 22  
<212> PRT  
<213> Xenopus laevis

<400> 25  
Asn Ser Gln Leu Ala Val His Lys Leu Ala Lys Ser Ile Pro Val Arg  
1 5 10 15  
Arg Gln Val Thr Val Ser  
20

<210> 26  
<211> 22  
<212> PRT  
<213> Homo sapiens

<400> 26  
Ser Ser Gln Pro Ala Val His Lys Leu Thr Lys Arg Ile Pro Leu Arg  
1 5 10 15  
Arg Gln Val Thr Val Ser  
20

<210> 27  
<211> 22  
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<213> Xenopus laevis

<400> 27  
Phe Thr Gly Pro Pro Val His Lys Leu Thr Lys Arg Ile Pro Leu His  
1 5 10 15  
Arg Gln Val Thr Val Ser  
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<210> 28  
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<212> PRT  
<213> Homo sapiens

<400> 28  
Gly Ser Pro Thr Val His Lys Ile Ser Arg Phe Pro Leu Lys Arg Gln  
1 5 10 15

Val Ser Leu Glu  
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<210> 29  
<211> 20  
<212> PRT  
<213> Mus musculus

<400> 29  
Gly Ser Pro Thr Val His Lys Val Ser Arg Phe Pro Leu Lys Arg Gln  
1 5 10 15  
Val Ser Leu Glu  
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<210> 30  
<211> 21  
<212> PRT  
<213> Xenopus laevis

<400> 30  
Thr Ala Pro Pro Val His Lys Val Ser Arg Phe Pro Leu Lys Arg Gln  
1 5 10 15  
Gln Val Ser Leu Glu  
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<210> 31  
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<212> PRT  
<213> Homo sapiens

<400> 31  
Arg Pro Pro Ala Thr Val Gln Lys Leu Ser Arg Phe Pro Leu Ala Arg  
1 5 10 15  
Gln Phe Ser Leu Glu  
20

<210> 32  
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<400> 32  
Arg Gln Pro Val Thr Ile Gln Lys Leu Ser Arg Phe Pro Leu Ala Arg  
1 5 10 15  
Gln Phe Ser Leu Glu  
20

<210> 33  
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<212> PRT  
<213> Xenopus laevis

<400> 33

Leu Gln Thr Pro Thr Val His Lys Leu Ala Lys Phe Pro Leu Ile Arg  
 1 5 10 15  
 Gln Phe Ser Leu Glu  
 20